



**Common Imagery Interoperability
Working Group
Management Plan**

8 May 1996

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1. INTRODUCTION

The Imagery Standards Management Committee (ISMC) established the Common Imagery Interoperability Working Group (CIIWG) to develop standards to help achieve portability, reusability, and interoperability of software components in information systems within the United States Imagery System (USIS). The CIIWG is a forum composed of government and commercial participants working together to create standards for Application Program Interfaces (APIs).

The API specifications are written in the Object Management Group's (OMG) Interface Definition Language (IDL). These specifications are generically referred to as Facilities. For imagery-unique applications, specifications are referred to as Common Imagery Interoperability Facilities (CIIFs). Appropriate Facilities are submitted to commercial standards organizations, such as the OMG, for commercial adoption.

1.1. Purpose

The purpose of this plan is to establish the management strategy to guide development of CIIFs.

1.2. References

References used to develop this plan are listed in appendix A.

1.3. Scope

This plan defines the roles and relationships of all participants involved with CIIF development efforts. The CIIF development and approval process defines the major tasks in Facility development and the method by which Facilities will be approved, certified, and standardized. The scope of this plan includes all phases of Facility development, including the following:

- Facility Requirements Identification
- Specification
- Testing
- Certification
- Adoption
- Implementation

1.4. Applicability

This plan applies to all CIIWG members and to Executive Agents designated to develop CIIFs.

1.5. Authority

The authority for this plan is derived from the *CIIWG Charter*, reference A.1.

1.6. Policy

This plan conforms with policies established by DOD 4120.3-M.

1.7. Responsibilities

The CIIWG is the forum for developing the imagery community's API specifications (CIIFs). Responsibilities of CIIWG participants are outlined in section 4.

1.8. Glossary

Terms used in this plan are listed in appendix B.

1.9. Security

Record copies of the documents supporting the management process are maintained and safeguarded according to applicable DOD regulations and directives.

1.10. Supersession

This document is the initial issue of the *Common Imagery Interoperability Working Group Management Plan*.

1.11. Changes

Proposed changes to this plan may be forwarded to the following:

Central Imagery Office
STSD/SD/SB
8401 Old Courthouse Road
Vienna, Virginia 22182-3820

Appendices with scheduling information will not be subject to configuration management.

2. COMMON IMAGERY INTEROPERABILITY FACILITY OVERVIEW

The term *Facility* comes from the Object Management Group (OMG) lexicon and is a specification which describes a collection of closely-related software interfaces. Facilities are defined for those interfaces that require standardization. Within the USIS, facilities define service-to-service interactions, as described in Reference A.8, *USIS Technical Architecture Requirements*.

2.1. CIIF Reference Model Architecture

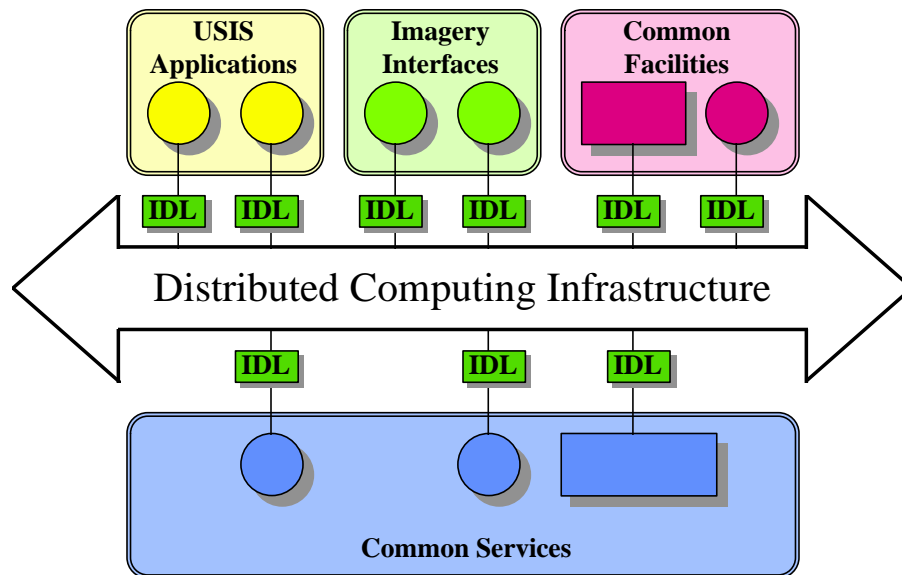


Figure 1: CIIF Reference Model

The CIIF Reference Model (figure 1) classifies the components, interfaces, and protocols that comprise an object system. The model has six key components:

- **Distributed Computing Infrastructure** – Enables software objects to make and receive requests and responses within a distributed environment
- **Common Services** – A collection of fundamental services (interfaces and objects) that provide basic functions for using and implementing other software objects
- **Common Facilities** – A collection of higher-level services that are broadly usable by many applications
- **Imagery Interfaces** – Standard interfaces that promote object-based interoperability within the imagery community or application domains

- **USIS Applications** – Software objects specific to the USIS, including particular commercial products or end-user systems
- **Interface Definition Language (IDL)** – A formal language (defined and standardized by OMG) that is used to define the interfaces between interoperable software objects.

At a more detailed level, Common Facilities and Imagery Interfaces are defined as those interfaces and uniform sequencing semantics that are shared across applications in such a way as to make object-oriented distributed computing applications much easier to create. Common Facilities and Imagery Interfaces comprise both generic facilities and domain-specific specifications. Examples of the kinds of inter-application services provided by Common Facilities and Imagery Interfaces include object cataloging and browsing, help facilities, object rendering, printing and spooling, and objects which implement generic business rules for the imagery industry.

2.2. Evolution of Common Facilities and Domain Interfaces

The roles, uses, and definitions of individual Common Facilities and Imagery Interfaces have the potential to evolve over time. Imagery Interfaces that are used extensively in a variety of similar applications may gradually change from being domain-specific to being generic in character. Moreover, services that are offered across multiple application domains are good candidates for incorporation into future versions of the Common Facilities. Discovery of such commonalities will be a favorable indicator of the maturation of these standards.

The boundaries separating Common Facilities and Imagery Interfaces from USIS Applications (in the one direction) and from Common Services (in the other direction) are therefore not fixed and immutable, but rather, are a reflection of the state-of-the-art in object system technology. As experience in a particular application domain advances, areas of potential new Imagery Interfaces or Common Facilities will be discovered and defined - just as evolving system infrastructures will gradually incorporate pieces of the Common Facilities into their basic Common Services offerings.

Operations provided by the Common Services component of the CIIF Reference Model are expected to serve as key building blocks for Common Facilities, Imagery Interfaces, and USIS Applications. Common Facilities and Imagery Interfaces, in turn, provide higher-level interoperable interfaces that can be specialized for particular USIS Applications. The practical application of these various levels of standard interfaces and services makes extensive use of (and in fact, depends upon) the object-oriented concept of inheritance (Figure 3-2). Compiler-based support for these inheritance processes has been built-in to OMG's Interface Definition Language (IDL), via its various standard language mappings. Inheritance facilitates the standardization of interfaces, promotes interoperability between objects conforming to the base standard, and enables the design of consistent interfaces between otherwise disparate object types.

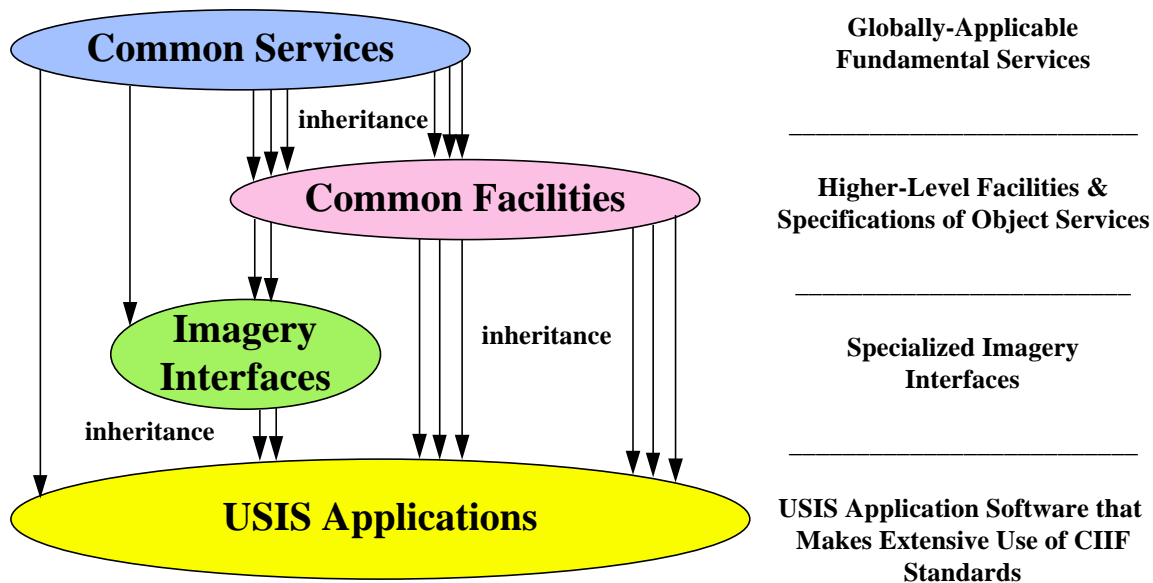


Figure 2: Reuse of Common Services, Common Facilities, and Imagery Interfaces

In non-object-oriented software architectures, a system's Application Program Interface (API) is typically defined by a fixed, monolithic, interface structure. The IDL-based API that is intrinsic to the CIIF Reference Model, on the other hand, is fully modular—the developer of an application object can pick and choose exactly those interface elements that are needed to fulfill design objectives. In other words, in contrast to the case for the traditional style of API, the object-oriented APIs provided by IDL-specified Imagery Interfaces and Common Facilities are extensible, customizable, and subset-able. This high degree of adaptability will facilitate the controlled evolution of such object-based standards, thereby helping to ensure the long-term viability of the technology.

2.3. Imagery Interfaces

2.3.1. Information Access Interfaces

The ability to interoperably store and retrieve imagery and imagery-derived data, combined with greatly enhanced abilities to search for these data, are fundamental to the architecture of the objective USIS.

Analysis of the *USIS Technical Architecture Requirements*, coupled with an effort to apply the CIIF's distributed computing architecture principles, has led to the definition of the following facilities:

- **Catalog Access Facility** - Supplies a set of common software interfaces to support both local and global imagery product discovery, product attribute (metadata) retrieval, product browsing, and product cataloging and indexing
- **Image Access Facility** - Defines a set of interfaces for retrieving selected imagery products from an imagery library, and for updating the contents of an imagery library (by storing, deleting, or modifying imagery products)
- **Imagery Compression Facility** - Defines a set of interfaces to generalized services for imagery compression and decompression, and for conversion between internal representations and standardized representations of such data.
- **Imagery Dissemination Facility** - Defines the interfaces required to receive, prepare (i.e., reformat, compress, decompress, etc.), prioritize, and transmit imagery products; also defines standard interfaces to support product distribution management
- **Profile and Notification Facility** - Supplies a set of standard interfaces to support the registration and maintenance of standing interest profiles for imagery consumers; also provides interfaces to support the screening of products against these profiles, and to route products or product availability notifications, as appropriate
- **Video Access** - Supplies a set of common software interfaces to support both local and global video imagery product discovery, product attribute (metadata) retrieval, product browsing, product cataloging and indexing, product retrieval, and for updating the contents of a library (by storing, deleting, or modifying video products).

These interfaces are intended to apply to all manner of imagery, imagery products, and imagery-related metadata. The goal is to provide uniform interface mechanisms for handling monochrome still images, color images, stereo pairs, multi-spectral images, full-motion video, co-registered images, maps, and graphics, three-dimensional (solid) visual models, as well as various combinations of these.

2.3.2. Exploitation Support Interfaces

Imagery exploitation is fundamental to the USIS. It leads to the generation of intelligence reports and other products which ultimately reach policy makers and other consumers of intelligence. Additional exploitation facilities are likely to be added to this reference model. The following list represents the current proposed categories of facilities for imagery exploitation services:

- **Image Mensuration Facility** - Provides standard interfaces to software tools that are designed to measure the spatial characteristics of objects appearing within images
- **Image Processing Facility** - Provides interfaces to standard algorithms for manipulating imagery (resizing, changing color and contrast values, applying various filters, manipulating image resolution, etc.) and for conducting mathematical analyses of image characteristics (computing image histograms, convolutions, etc.)

- **Image Registration Facility** - Provides standard interfaces for automatically aligning, co-registering, or otherwise determining image-to-image spatial correlations on the basis of image content
- **Geopositioning Facility** - Defines standard interfaces to software tools that support the derivation of precise geographic coordinates on images and maps.
- **Automatic Target Recognition** - Provides standard interfaces to software tools that are designed to automatically detect, categorize, count, and determine relationships between objects appearing within images
- **Image Synthesis** - Provides a common software interface for creating or transforming images using computer-based spatial models, perspective transformations, and manipulations of image characteristics to improve visibility, sharpen resolution, and/or reduce the effects of cloud cover or haze
- **Image Understanding** - Enables automated image change detection, registered image differencing, significance-of-difference analysis and display, and area-based and model-based differencing.
- **Video Exploitation** - Provides access to automated tools for the exploitation of video imagery.

2.3.3. Management Support Interfaces

Providing enhanced management capabilities to improve the ability to track the collection, processing, and exploitation management workflow is essential to the USIS. Although facilities to standardize the associated interfaces have not yet been identified or defined, Management Support Interfaces are expected to provide support for the following transactional capabilities:

- **Imagery Collection Management** - Enables clients to submit imagery nominations and obtain feedback on the status of nominations; also passes resource and requirement information between the Management Element and the Digital Collection, Digital Processing, and Digital Exploitation Elements
- **Collection Forecast Reporting** - Passes collection planning data between the Management, Digital Collection, Digital Processing, and Digital Exploitation Elements
- **Exploitation Task Management** - Conveys exploitation task packages, task assignments, exploitation assignment status data, and exploitation resource availability information between the various components of the Digital Exploitation Element
- **Accomplishment Status Reporting** - Provides feedback, status, and reporting information to the Management Element concerning workload accomplishment status within the Digital Collection, Digital Processing, Dissemination, Digital Exploitation, and Library Elements

- **Operational Status Reporting** - Bears resource organization and operational statistics/status data between components of the Management Element and the Digital Collection, Digital Processing, Dissemination, Digital Exploitation, and Library Elements.

2.3.4. Collection Support Interfaces

This section represents a compendium of the interfaces needed to handle the unique requirements for passing unprocessed imagery from the Digital Collection Element to the Digital Processing Element.

- **Unprocessed Imagery Transfer** - Provides the interfaces necessary to handle the unique requirements for passing unprocessed imagery from the Digital Collection Element to the Digital Processing Element.

2.4. Common Facilities & Services

2.4.1. Common Facilities

The following Common Facilities, which are likely to be developed by other organizations such as OMG, fulfill key requirements of the USIS Technical Architecture. As the IDL specifications for each of these facilities are completed and published, they will be thoroughly evaluated, and those that are found to meet the requirements for the USIS will be adopted as a component of the CIIF.

- **Automation and Scripting Facility** - Defines conventions and interfaces that allow access to the key functionality of an object from another object. The design goal of this facility is to support user visible objects which are larger grained than the typical ORB object. The typical object acted upon by the Automation and Scripting Facility would be a document, a paragraph, a spreadsheet cell, and so forth. The emphasis of the facility is for objects to expose enough of their capabilities so they may be driven by scripts and macros.
- **Common Management Facility** - Provides a set of utility interfaces for system administration functions. These abstract basic functions such as control, monitoring, security management, configuration, and policies that are needed to perform systems management operations, such as adding new users, setting permissions, installing software, and so forth.
- **Compound Presentation and Interchange Facility** - Enables the creation of cooperative component software that supports compound documents, that can be customized, that can be used collaboratively, and that is available across multiple platforms. Also provides for the storage and interchange of data objects, and roughly maps to the persistent storage subsystem of a compound document architecture.
- **Data Interchange Facility** - Allows for the exchange of information across networks of heterogeneous computer systems by providing a common information model and a

common way of encoding information within that model. Encoding must support not only character data, but other sorts of data as well, including imagery, graphics, multimedia documents, and electronic mail. Enables objects to interoperate through exchange of data, and can be used for many forms and kinds of data transfer, such as: bulk data transfer; interchange of formatted data such as TIFF, GIF, EPS, NITF, etc.; structured data transfer such as OMG IDL specified data types; interchange of domain-specific object representations; and the data interchange between objects and encapsulated software (legacy applications).

- **Information Storage and Retrieval Facility** - Comprises the higher level storage and retrieval specifications for distributed applications. These specifications will be applicable to a wide range of information services, including data base access and information highways.
- **Internationalization and Time Operations Facility** - Enables developers to use an information system or application in their own language using their own cultural conventions. In addition, this technology will allow the developer to use a culture's numeric and currency conventions, and keep track of time zones.
- **Meta-Object Facility** - Defines the interfaces and sequencing semantics needed to create, store and manipulate object schemas that define the structure, meaning, and behavior of other objects within the OMG Object Management Architecture. These objects may be application objects, common business objects, objects representing analysis and design models of applications, or objects providing the functionality of Common Facilities and Common Services. The Meta-Object Facility can be used in an information system (such as a repository) that enables an enterprise to specify and manage a wide variety of information assets with a common, integrated set of services. The use of a common meta-object facility for specifying the schemas of the information assets will play a key role in helping to achieve data and process integration by enabling tools and processes to share information and coordinate activities.
- **Mobile Agents Facility** - Supports the need to create massively distributed information systems over Wide Area Networks. Agent technology efforts range from building these massively distributed systems to mobile information systems, intelligent workflow systems, and agile corporation information structures.
- **Printing Facility** - One component of a coordinated set of facilities and standards needed to satisfy the printing requirements of the modern distributed office. Together, the capabilities provided must enable users to create and produce high-quality documents in a consistent and unambiguous manner within a distributed object environment. The Printing Facility should be able to meet a range of printing requirements from simple one document, one copy printing, all the way up to high volume production printing, which might involve several documents, several copies, several printers.
- **Rendering Management Facility** - Provides facilities to present information for output on devices such as screens, printers, plotters and sound and speech output devices. It also handles user input from a variety of hardware devices such as a mouse, keyboard, scanner, speech recognition device, digital camera, and security devices.

Rendering management includes support for window management, class libraries for user interface objects, user interface dialog objects, and abstractions of the many different input/output devices.

- **Security Administration Facility** - Provides standard interfaces, as well as the necessary control mechanisms, to facilitate required security protections, including provisions for:
 - User registration, password maintenance, permissions maintenance
 - Access control, authentication, and audit trail maintenance
 - Resource registration
 - Security classification downgrading
 - Encryption key management
 - Discretionary and mandatory access controls
- **Workflow Facility** - Provides management and coordination of objects that are part of a work process for example, purchase orders. The facility will provide support for production-based workflow, which is structured, pre-defined processes that are governed by policies and procedures, as well as ad-hoc, or coordination-based workflows, which are evolving workflows defined by one or more people to support the coordination of knowledge workers.

2.4.2. Common Services

The following Common Services, which are likely to be developed by other organizations such as OMG, fulfill key requirements of the USIS Technical Architecture. As the specifications for each of these services are completed and published, they will be thoroughly evaluated, and those that are found to meet the requirements for the USIS will be adopted as a component of the CIIF.

- **Collections Service** - Provides a uniform way to generically create and manipulate the most common collections. Collections are groups of objects which, as a group, support some operations and exhibit specific behaviors related to the collection, such as stacks, queues, and lists.
- **Concurrency Control Service** - Enables multiple clients to coordinate their access to shared resources. Coordinating access to resources means that when multiple, concurrent clients access a single resource, any conflicting actions by the clients are reconciled so that the resource remains in a consistent state. The Concurrency Control Service consists of multiple interfaces that support both transactional and non-transactional modes of operation.
- **Event Service** - Provides basic capabilities that can be configured together in a very flexible and powerful manner. Asynchronous events (decoupled event suppliers and

consumers), event “fan-in,” notification “fan-out,” and - through appropriate event channel implementations - reliable event delivery are supported. Both push and pull event models are supported i.e., consumers can either request events or be notified of events, whichever is needed to satisfy application requirements.

- **Externalization Service** - Defines protocols and conventions for the externalization and internalization of objects. Externalizing an object is to record the object state in a stream of data (in memory, on a disk file, across a network, etc.) and then internalize it into a new object in the same or different process. The externalized object can exist for arbitrary amounts of time, be transported by means outside the ORB, and be internalized in a different, disconnected ORB.
- **Interface Type Versioning Service** - Provides for the management of the evolution of interfaces and their IDL descriptions. The service will provide the ability for a system to recognize that a new interface has evolved from an old one, allow multiple versions of the “same” interface to exist at the same time, allow for a choice of automatic or manually specified conversion to use of a new interface, and support the concept of a default version of an interface.
- **Licensing Service** - Provides a mechanism for producers to control the use of their intellectual property in a manner determined by their business and customer needs. This service offers fundamental usage control.
- **Life Cycle Service** - Defines services and conventions for creating, deleting, copying, and moving objects. Because Distributed Computing Environments support distributed objects, life cycle services define services and conventions that allow clients to perform life cycle operations on objects in different locations.
- **Messaging Service** - Provides interfaces that allow clients to make requests on an object without blocking the client execution thread. Some requests are not expected to be complete during the lifetime of the client execution environment, so mechanisms will be established to receive the response and process it appropriately. The service allows object servers to control the order in which incoming requests are processed.
- **Naming Service** - Provides the ability to bind a name to an object relative to a naming context. A naming context is an object that contains a set of name bindings in which each name is unique. To resolve a name is to determine the objects associated with the name are given context. Through the use of a “names library,” name manipulation is simplified and names can be made representation independent thus allowing their representation to evolve without requiring client changes.
- **Persistent Object Service** - Provides common interfaces to the mechanisms used for retaining and managing the persistent state of objects. The Persistent Object Service will be used in conjunction with other object services, for example, naming, relationships, transactions, life cycle, etc. The Persistent Object Service has the primary responsibility for storing the persistent state of objects, with other services providing other capabilities.
- **Properties Service** - Provides the ability to dynamically associate named values with objects outside the static IDL type system. The interfaces provided by this service are used for defining, deleting, modifying, enumerating, and checking for the existence of

properties. By using the interfaces defined by the Property Service, useful information can be associated with an object's state, for example, a title or a date.

- **Query Service** - Provides query operations on collections of objects. The queries are predicate-based and may return collections of objects. They may be specified using object derivatives of SQL and/or other styles of object query languages including direct manipulation query languages. Query operations include selection, insertion, updating, and deletion on collections of objects or data.
- **Relationship Service** - Allows entities and relationships to be explicitly represented. Entities are represented as objects. The service defines two new kinds of objects: relationships and roles. A role represents an object in a relationship. The Relationship interface can be extended to add relationship-specific attributes and operations. Similarly, the Role interface can be extended to add role-specific attributes and operations.
- **Security Service** - Protects an information system from unauthorized attempts to access information or interfere with its operation. It is concerned with:
 - Confidentiality: information is disclosed only to users authorized to access it.
 - Integrity: information is modified only by users who have the right to do so, and only in authorized ways. It is transmitted only between intended users and in intended ways.
 - Accountability: users are accountable for their security relevant actions. A particular case of this is non-repudiation where responsibility for an action cannot be denied.
 - Availability: Use of the system cannot be maliciously denied to authorized users.
- **Startup Service** - Enables requests to automatically start up when an Object Request Broker is invoked.
- **Time Service** - Maintains current time, ascertains order in which events occurred, and computes the interval between two events.
- **Trader Service** - Provides a matchmaking service for objects — registers availability of the service, provides parameters, distinguishing attributes, and names of operations to which it will respond. It also allows objects in different domains to negotiate and share services without losing control of their own policies and services.
- **Transaction Service** - Supports multiple models (flat and nested) of transactional behavior in a distributed heterogeneous environment. The Transaction Service brings the transaction paradigm, essential to developing reliable distributed applications, and the object paradigm, key to the productivity and quality in application development, together to address the business problems of commercial transaction processing.

3. DEVELOPMENT PROCESS

The CIIF development process mirrors the IT standards process shown in figure 3, adopted from JIEO Plan 3200. The model shows how Facilities are adopted, developed, and certified. The process establishes and maintains commercial, federal, and military standards, with a priority on adopting non-government standards where they satisfy government requirements.

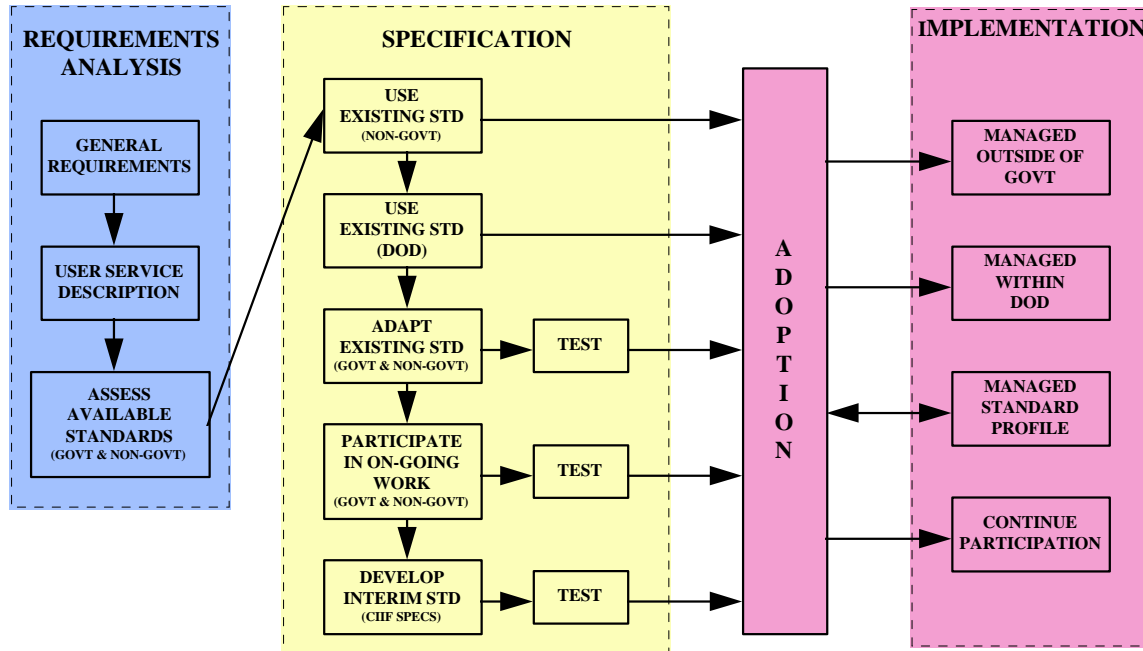


Figure 3: Imagery IT Standards Process

3.1. Requirements Analysis

Requirements Analysis activities are illustrated in figure 4. Key activities are shaded and bounded by the hatched-line box in the figure. Table 1 identifies organizations responsible for each of these activities.

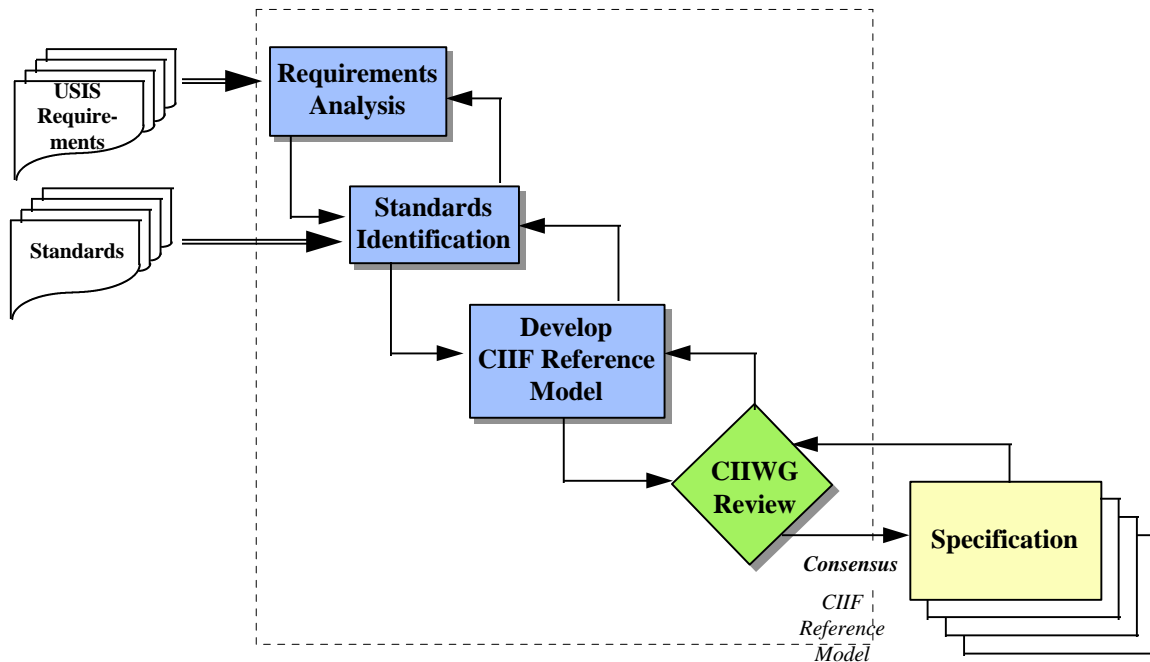


Figure 4: Requirements Analysis

3.1.1. Requirements Analysis

The CIO is responsible for requirements analysis to identify imagery users' needs for Common Imagery Interoperability Facilities. Requirements for CIIFs are derived from USIS architecture documents including, but not limited to, the following:

- *USIS Concepts of Operations (CONOPS)*
- *USIS Technical Architecture Requirements*
- *USIS Objective Architecture Definition and Evolution*
- *USIS Management Plan*
- *HAE UAV Concepts of Operations*

3.1.2. Standards Identification

The CIO identifies relevant standards to further scope Facilities. Standards analysis helps ensure that Facility specifications comply with standards established for the USIS. Standards that feed this process include the following:

- *Technical Architecture Framework for Information Management (TAFIM)*
- *Intelligence Community Standards Profile*
- *USIS Standards & Guidelines (USIS S&G)*
- *Standards Profile for Imagery Access (SPIA)*
- *CIGSS Acquisition Handbook*
- *Joint Technical Architecture*

Once the requirements for the facility are identified and the particular USIS service is described, an assessment is made to determine if either a government or commercial Facility is available that can meet the requirements. The assessment will result in one of four possible outcomes:

- An existing Facility (government, commercial) may be identified which is completely adequate “as-is” to satisfy the requirements.
- An existing Facility (government, commercial) may be adequate provided a profile is developed which specifies its implementation.
- A Facility (government, commercial) may be under development that has the potential to meet the requirements.
- The voluntary (commercial) Facility development process is not addressing the requirements, and a CIIF needs to be developed.

3.1.3. Develop CIIF Reference Model

The CIO assesses the results of the Requirements Analysis and Standards Identification phases to develop the *CIIF Reference Model*. The *CIIF Reference Model* is a technical description of the imagery intelligence user’s requirement for a standards service or capability. It describes the Facilities’ scope, applicability, definition, framework, and technical usage. The reference model guides the development of IDL specifications by establishing the overall structure and organization of the inter-related collections of Facilities in the USIS.

3.1.4. CIIWG Review

The *CIIF Reference Model* is presented to the CIIWG for review of the proposed facilities. The CIIWG review assures the quality of the Facility definitions by determining whether they address USIS interoperability needs. When consensus is reached, as defined in Section 5, the *CIIF Reference Model* is forwarded to the Executive Agent for development of assigned Facilities. Specific review criteria for the CIIF Reference Model should include:

- Does the Facility satisfy the USIS requirement?
- Is the Facility domain specific, or can a commercial Facility or Service satisfy the requirement?
- Are the Facility's services functionally cohesive?
- Are the Facility's definitions clear, concise, and unambiguous?

3.2. Specification

Specification activities are illustrated in figures 5 and 6. Key activities are shaded and bounded by the hatched-line box in the figure. Table 1 (section 4) identifies organizations responsible for each of these activities. The Executive Agent is responsible for configuration management of Facility specifications, sample implementation software, and related documentation throughout the specification process described in this paragraph.

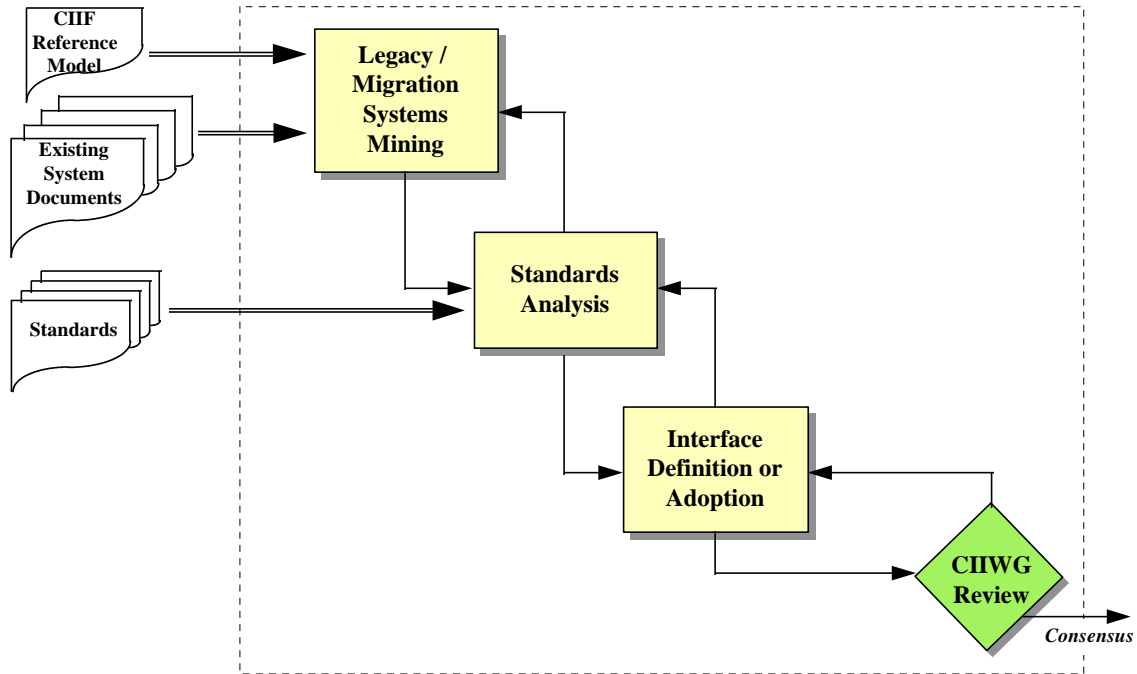


Figure 5: Specification

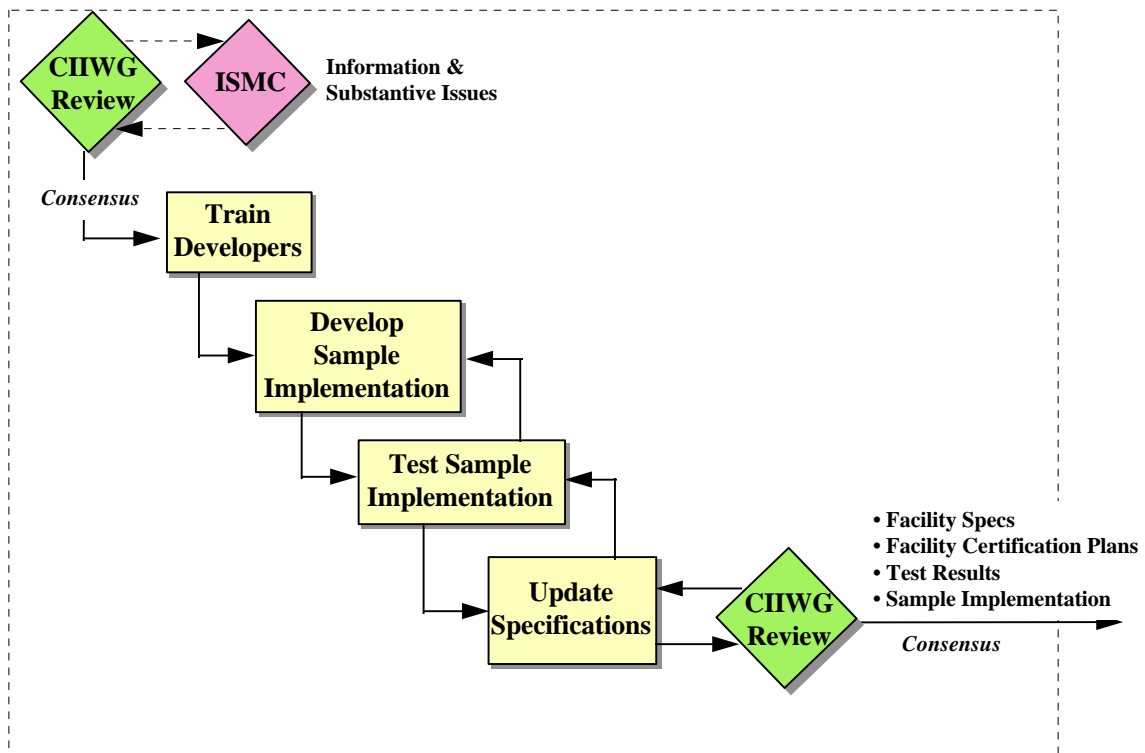


Figure 6: Specification (Continued)

3.2.1. Legacy / Migration Systems Mining

The Executive Agent uses the *CIIF Reference Model* to guide the development of its assigned Facility. The Executive Agent reviews relevant current and emerging technologies to ensure the robustness of developed Facilities. For example, the OMG has established an architecture and set of specifications based on commercially available object technology which enables distributed integrated applications. Lessons-learned and other valuable knowledge gained through experience with existing systems and systems in the development stages provides bottom-up leveraging in this initial phase of Facility development.

3.2.2. Standards Analysis

In addition to the DOD standards identified in the *CIIF Reference Model*, the Executive Agent identifies relevant standards in the commercial domain. Facilities which comply with commercial standards will promote commercial technology insertion into facility implementations. Commercial standards, such as those established by the OMG, promote reusability, portability, and interoperability of object-based software components in distributed heterogeneous environments.

3.2.3. Interface Definition or Adoption

The desire is to maximize use of existing or proposed standards. This includes use of Facilities “as-is” or modification of existing Facilities. The Executive Agent applies the knowledge gained through the initial phases to create the IDL specifications for the assigned Facility. In the case that commercial specifications which satisfy the Facility’s scope and definition are available, the Executive Agent will adopt and tailor these specifications as required. The result of this activity is an IDL specification of the Facility.

3.2.4. CIIWG Review

The CIIWG will review the Executive Agent’s Facility specifications. Approved specifications will then be implemented by the Executive Agent as described below. Review criteria should include those criteria listed in paragraph 3.1.4 and the following:

- Is the specification written in IDL per *CIIF Reference Model* guidelines?
- Does the specification use only approved data elements (i.e. those described by the SPIA)?

The CIIWG will forward information and substantive issues concerning Facility developments to the ISMC, as part of the review.

3.2.5. Train Developers

The Executive Agent will train developers, as required, in the implementation technology to create sample implementations of the facility specifications.

3.2.6. Develop Sample Implementation

The Executive Agent's developers will implement Facility specifications to ensure they can be unambiguously implemented and satisfy user requirements.

3.2.7. Test Sample Implementation

The Executive Agent is responsible for testing the sample implementation to ensure it conforms with the specifications and to ensure the specifications are implementable. The tests will also provide lessons-learned and other relevant information about the quality of the Facility specifications.

3.2.8. Update Specifications

With the lessons-learned from testing the sample implementation, the Executive Agent can improve the Facility specifications. Upon updating the specifications, sample implementations will be updated and retested. This iterative process continues until the requirements for the Facility are fully met.

Upon completion of the sample implementation, the Executive Agent will submit the specifications and sample implementation source code to a Configuration Control Board (CCB) for configuration management. An example of a CCB is the Imagery Configuration Control Board (ICCB). Note that the configuration managed specification is not considered a standard until it is approved by the ISMC.

The proposed Facility IDL specification is submitted to the CIIWG for consensus approval. Upon CIIWG consensus approval, the Facility specification, Facility certification plans, sample implementation test results, and government developed sample implementation source code are submitted to the ISMC for formal adoption and implementation.

3.3. Adoption and Implementation

The Adoption and Implementation activities are illustrated in figure 7. The policies regarding the standardization document development process are governed by the Defense Standardization Program (DSP) and outlined in the DOD 4120.3-M. The ISMC assumes configuration management responsibility from the Executive Agent after the ISMC has approved the Facility specification as a USIS Standard or as a proposed Military or commercial standard.

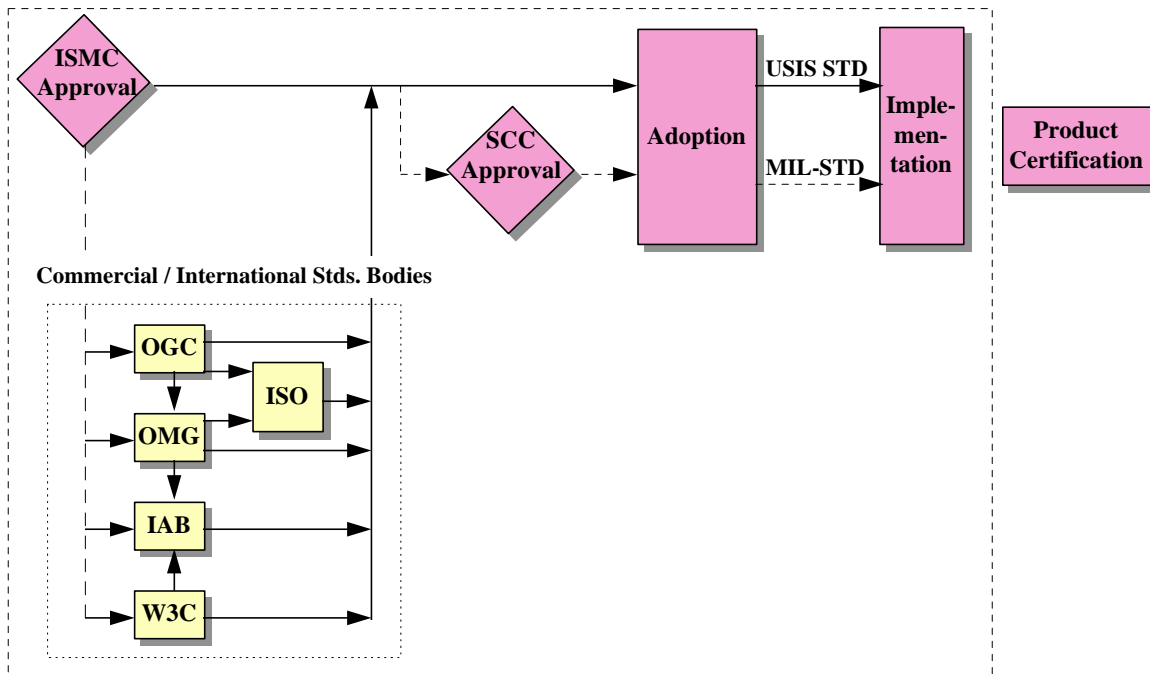


Figure 7: Adoption and Implementation

3.3.1. Imagery Standards Management Committee Approval

The ISMC is responsible for coordinating, reviewing, and approving Facility specifications and change proposals submitted by the CIIWG. Facility specifications and change proposals will be submitted to the ISMC secretariat. In coordination with the chair, the secretariat will determine the appropriate course of action, which may include the following:

- Adopt the Facility specification as a USIS Standard, and incorporate into the *USIS Standards & Guidelines*.
- Refer the Facility specification or change proposal to the Standards Coordinating Committee (SCC) or the Intelligence Systems Board (ISB).
- Forward the Facility specification to commercial/international standards bodies as proposed standards.
- Return the Facility specification or change proposal to the CIIWG with a memorandum reflecting why the Facility specification or change proposal is being returned and, when appropriate, a recommended alternative course of action.

3.3.2. Commercial / International Standards Bodies

The appropriate commercial/international standard body will coordinate, review, and approve Facility specifications submitted by the ISMC. The intent is for these non-Government

organizations to adopt and implement CIIWG developed Facility specifications as commercial standards. Such organizations include the following:

- Open GIS Consortium
- Object Management Group
- International Standards Organization
- Internet Activities Board
- World Wide Web Consortium

3.3.3. Standards Coordinating Committee Approval

Facility specifications which are determined by the ISMC to have wider applicability within the DOD/Intelligence Community will be submitted to the Standards Coordinating Committee. The SCC will coordinate, review, and approve Facility specifications submitted by the ISMC as Military Standards.

3.3.4. Adoption

Approved Facility specifications may take the following courses:

- The ISMC may unilaterally adopt a Facility specification as a USIS Standard.
- SCC approved Facility specifications will be adopted as a Military Standard.
- Facility specifications which have been coordinated, reviewed, and approved by commercial/international standards organizations may be adopted as a USIS Standard or MIL-STD.

As part of the adoption process, Facility specifications which become USIS Standards, MIL-STDs, and/or commercial/international standards will be included in appropriate standards profiles, which include the following:

- *USIS Standards & Guidelines*
- *Technical Architecture For Information Management*
- *Joint Technical Architecture*

3.3.5. Implementation

The ISMC pursues effective imagery IT standards implementation throughout DOD. A systematic approach is devised to insert standards into the planning, requirements definition, and acquisition of imagery systems. The DOD directives on acquisition, DODD 5000.1 (reference A.17) and DODI 5000.2 (reference A.18) describe the general procedures to identify, document, present requirements, and report progress. Implementation addresses operational assessment, configuration management, acquisition support, and enforcement.

Operational assessment and user feedback of fielded systems based upon CIIF standards will provide the basis for enhancing the standards.

Configuration management is the process to maintain standards from the date of first publication until cancellation. The CIIWG is responsible for change preparation activities such as coordinating Requests for Changes (RFCs) and presenting such change proposals to the ISMC for approval. The ISMC serves as the CCB responsible for maintaining the CIIF standards from publication until cancellation. The ISMC executes this responsibility in conformance with DOD 4120.3-M (reference A.2), JIEO PLAN 3200 (reference A.4), and the 29 June 1994 SECDEF Memorandum (reference A.15).

The ISMC supports acquisition by ensuring that the necessary CIIF standards are available to meet the imagery user's operational needs.

Existing acquisition directives will be used as the CIIF standard enforcement mechanism. The ISMC will support DOD efforts to assist the acquisition community in using a standards-based acquisition approach.

3.4. Product Certification

The JITC will establish a capability to test, certify, and brand commercial and government products' conformance to Facility specifications. Products are submitted to the JITC for certification as desired by the product producers.

4. ORGANIZATION

This section describes the primary participants involved in CIIF development. Table 1 maps the organization to its respective responsibilities. The process steps in Table 1 are described in section 4.

ORGANIZATION	CIO	CIIWG	Exec Agents	NEL	JITC	ISMC	SCC	Comm/ Int Stds Orgs
DEVELOPMENT PROCESS								
Requirements Analysis								
• Requirements Analysis	P							
• Standards Identification	P							
• Develop CIIF Reference Model	P			C				
• CIIWG Review		P				C		
Specification								
• Legacy / Migration Systems Mining			P	C				
• Standards Analysis			P	C				
• Interface Definition or Adoption			P	C				
• CIIWG Review		P				C		
• Train Developers			P	C				
• Develop Sample Implementation			P	C				
• Test Sample Implementation			P	C	C			
• Update Specifications			P	C				
• CIIWG Review		P				C		
Adoption *	P					C	P	P
Implementation	P	C			C	C	C	
Product Certification	C				P			

Table 1: Organization Responsibilities
[P = Primary Responsibility, C = Coordination]

* The ISMC adopts Facility specifications as USIS Standards, the SCC adopts specifications as MIL-STDs, and commercial/international standards organizations adopt specifications as industry standards.

4.1. Central Imagery Office (CIO)

The CIO, under directives from the DOD and the DCI, is responsible for imagery for all US Government agencies with national security interests. A function of the CIO is to adopt and develop imagery-related standards for use within the Department of Defense and other Intelligence Community organizations.

4.2. Imagery Standards Management Committee (ISMC)

Chartered by the Defense Information Systems Agency (DISA) Standards Coordinating Committee (SCC) and the Intelligence Systems Secretariat (ISS), the ISMC is the management forum for the DOD and Intelligence Community (IC) imagery information technology standards process.

4.3. Common Imagery Interoperability Working Group (CIIWG)

The ISMC established the CIIWG to facilitate adoption or development of open, standard APIs for use by imagery system developers, both government and commercial. The CIIWG shall lead, manage, integrate, and coordinate IC efforts to develop and implement imagery-related APIs in information systems. Specific responsibilities of the CIIWG include:

- Define the scope of the CIIF.
- Solicit and coordinate participation of relevant imagery community experts in the Facility development process.
- Specify each Facility required by the USIS.
- Report its findings and make recommendations to the ISMC on all proposed Facilities.
- Present completed Facility specifications to the ISMC for incorporation into the USIS standards profile.
- Maintain and manage the evolution of Facility specifications.

The CIIWG will present to the ISMC the following items:

- *CIIF Reference Model*
- Facility specifications
- Facility Certification Plans
- Sample Implementation Test Results

- Government Developed Sample Implementation Source Code

All products of the CIIWG will be placed in the public domain. The government will retain non-exclusive rights to use and distribute all CIIWG products. All members of the CIIWG, including Executive Agents, agree to this policy as a condition of membership in the CIIWG.

4.4. Executive Agent

An Executive Agent is a CIIWG member organization which has volunteered and been designated by the CIIWG Chair to take the technical lead in developing one or more Facilities. The Executive Agent will create the CIIF specifications, develop a sample implementation based on these specifications, and conduct testing of the sample implementation.

Executive Agents submit their specifications to the CIIWG for approval and provide bi-monthly status reports to the CIIWG.

4.5. National Exploitation Lab (NEL)

The CIO requested and obtained support from the NEL for CIIF development efforts. The NEL's tasks include the following:

- Participate in and provide technical advice at CIIWG meetings and at technical exchange meetings called by the CIIWG Chair.
- Review documentation and updates developed by the CIIWG for consistency, correctness, completeness, compliance with appropriate standards, relevance, and readability.
- Assist with the preparation of the *CIIF Reference Model* by providing detailed technical advice and review.
- Provide testbed and development resources to support the installation, configuration, testing, and evaluation of CIIF sample implementations.

4.6. Joint Interoperability Test Command (JITC)

The DISA Joint Interoperability Test Command, is responsible for establishing a comprehensive testing program for supporting information technology system standards in accordance with guidance from the Office of the Assistant Secretary of Defense (OASD(C3I)). Detailed information regarding IT standards related testing is contained in Reference A.3, *JIEO Circular 9002*.

4.7. Standards Coordinating Committee (SCC)

DISA's Standards Coordination Committee (SCC) is the principal DOD forum for IT standards matters, and charts the ISMC. DISA's Information Technology Standards Center (ITSC) is tasked by the CIO to provide studies of the viability of using the developed Facilities within the broader Intelligence Community. This study will address the following:

- Determine whether the developed Facilities are compatible and interoperable with the interfaces used by other Intelligence Community systems.
- Include recommendations for changes to information technology standards controlled by the following organizations:
 - Central Imagery Office
 - Intelligence Systems Board
 - Object Management Group
 - International Standards Organization

4.8. Commercial / International Standards Organizations

The commercial/international standards organizations targeted to receive proposed CIIF standards include the OMG, OGC, ISO, IAB, and the W3C.

4.9. Other Organizations

It is desired that imagery community programs implement the API standards developed by the CIIWG. Thus, CIIWG activities will be coordinated with current initiatives such as the following:

- Global Command & Control System (GCCS) / Defense Information Infrastructure (DII) Common Operating Environment (COE) Distributed Services Working Group
- Defense Mapping Agency's (DMA) Interoperable Map Software (IMS)

5. OPERATIONS

5.1. Membership

CIIWG members are designated by their organizations and accredited to the CIIWG with the authority to represent their organizations' interest and speak on their behalf on CIIF development related issues. CIIWG members include the following:

5.1.1. Chair

The CIIWG Chair is designated by the Imagery Standards Management Committee (ISMC) Chair, and is normally a member of the CIO.

5.1.2. Secretariat

The CIO provides the secretariat to perform the CIIWG administrative tasks as directed by the Chair.

5.1.3. Members

CIIWG members are any government, commercial, or educational organizations which have registered their desire to be members, via letter, to the CIIWG Chair. This letter should designate that organization's primary (voting) member and one or more alternates. Member organizations must regularly participate in CIIWG activities, by attending meetings or by providing input on agenda items via electronic mail.

5.1.4. Executive Agents

Executive Agents are responsible for developing assigned Facilities. Executive Agents shall provide status reports at CIIWG meetings.

5.2. Meetings

The CIIWG meets bi-monthly and at the Chair's request. Meeting dates are arranged to minimize schedule conflicts and maximize participation. The meetings follow a published agenda and are supervised and guided by the Chair.

The CIIWG secretariat prepares and distributes an agenda 28 days prior to scheduled meetings. Approved by the Chair, the CIIWG secretariat prepares and distributes a read-ahead package 14 days prior to scheduled meetings. The read-ahead package includes a meeting announcement with the meeting date, time, and location; the proposed agenda; and materials that may require comments, input, or decisions during the meeting.

The CIIWG secretariat prepares minutes documenting CIIWG decisions. Following the Chair's review, minutes are distributed. Minutes are approved at the next meeting and corrections are documented in that meeting's minutes.

Members not able to attend meetings are encouraged to electronically submit comments to the CIIWG chair based on the announced agenda.

5.3. Issues

Issues may be raised by any member to the Chair. Members may disagree with a decision and make it a substantive issue. The member declaring a substantive issue must submit a written appeal within 10 working days to the CIIWG Chair. Consensus will be reached when the majority of CIIWG members present agree. In addition, if a member organization does not respond to requests for comment or coordination within a scheduled due date, the lack of response shall be deemed as concurrence. An organization's primary CIIWG member, or designated alternate, is the organization's spokesperson.

The CIIWG secretariat will track actions, issues, and decisions and prepare reports as required.

5.4. Administration

5.4.1. Chair

The Chair is responsible for expeditious, proper, and orderly conduct of the CIIWG's business. Specifically, the Chair is responsible for the following:

- Define the CIIWG's task.
- Arrange the CIIWG schedule.
- Obtain CIIWG support.
- Draft and circulate CIIWG papers to members.
- Inform the ISMC when due dates cannot be met.
- Reach issue closure and provides recommended issue resolution.
- Fulfill charter responsibilities.
- Represent the CIIWG.
- Plan and program required resources.

The Chair may be contacted at:

Central Imagery Office
Code STSD/SD/SB
8401 Old Couthouse Road
Vienna, Virginia 22182-3820
Phone: (703) 275-5647
Fax: (703) 275-5088
Email: burns@dma.gov

5.4.2. Secretariat

The CIIWG Secretariat is responsible for the following:

- Performing the CIIWG administrative tasks.
- Publishing agendas and making CIIWG meeting arrangements.
- Preparing and distributing the CIIWG meeting minutes.
- Maintaining the CIIWG attendance record.
- Maintaining the CIIWG Home Page

The secretariat may be contacted at:

Logicon
1831 Wiehle Avenue
Reston, Virginia 22090
Phone: (703) 318-1074, ext.277
Fax: (703) 318-1098
Email: ciiwg@itsi.disa.mil

5.4.3. CIIWG Members

CIIWG members are responsible for the following:

- Attending CIIWG meetings.
- Providing the coordinated position of the organization represented. Bringing difficulties or delays in processing issues to the Chair's attention.
- Assisting the Chair in reaching issue resolution.

An e-mail reflector for all CIIWG members is available. Members may subscribe by sending an electronic mail message to "nitfs-request@linus.mitre.org." The message should state "subscribe nitf" and give the sender's name. Subscribers will receive a message confirming their subscription. Mail sent to "nitf@linus.mitre.org" is re-sent to all subscribers.

5.5. Document and Change Proposal Review

CIIWG members coordinate, review, and approve documents and change proposals to documents published by the CIIWG. Additionally, CIIWG members coordinate, review, and provide comments regarding documents and change proposals to documents related to USIS standards.

Documents and change proposals that require CIIWG coordination, review, and approval will be submitted to the secretariat. In coordination with the Chair, the secretariat will determine the appropriate course of action which may include the following:

- Forward the document or change proposal to an appropriate group with a memorandum tasking the group to address the issue and provide a recommendation.
- Add the document or change proposal to a scheduled CIIWG agenda.
- Refer the document or change proposal to the originating organization with a memorandum reflecting why the document or change proposal is being returned and, when appropriate, a recommended alternative course of action.

Following the CIIWG review and resolution of conflicts, the secretariat will prepare a cover memorandum to be signed by the Chair and forwarded to the originating organization. The memorandum will state that the document or change proposal was reviewed by the CIIWG, any issues that arose during the review, and the results of the review, to include approval when appropriate. Approved proposals will be submitted to the ISMC. Changes to this document, with the exception of schedule appendices, will be subject to established configuration management processes.

5.6. Correspondence

CIIWG Report. The Chair prepares reports addressed to the ISMC that provide the status of issues, recommendations regarding issues, or resolution of issues. The format will include a cover memorandum, on CIO letterhead, signed by the Chair. As appropriate, the cover memorandum will include the issue title, issue history, proposed issue resolution, any related issues, and a point of contact. Attachments to the cover memorandum are determined by the Chair.

5.7. Distribution

Initially, distribution will be primarily through the United States Postal Service and electronic mail. CIIWG members are tasked to keep the CIIWG secretariat informed of mail address,

electronic mail address, and telephone number changes. Whenever feasible, electronic mail is encouraged.

Documents and information pertaining to the ISMC and its Working Groups, including the CIIWG, are currently available at the following World Wide Web addresses:

- CIIWG Home Page: <http://www.itsi.disa.mil/ismc/ciiwg/>
- ISMC Home Page: <http://www.itsi.disa.mil/ismc/>
- ITSI BBS Telnet: [bbs.itsi.disa.mil](tel:bbs.itsi.disa.mil) (198.4.59.6)
- ITSI BBS Dial-In: (703) 834-6501 / DSN 653-8385

APPENDIX A REFERENCES

- A.1. *Common Imagery Interoperability Working Group Charter* , Central Imagery Office, Vienna, VA, 1 March 1996.
- A.2. DOD Directive 4120.3-M, *Defense Standardization Program (DSP) Policies and Procedures*, July 1993
- A.3. JIEO Circular 9002, *Requirements Assessment and Interoperability Certification of C4I and AIS Equipment and Systems*, 23 January 1995.
- A.4. JIEO Plan 3200, *Department of Defense Information Technology (IT) Standards Management Plan*, November 1993.
- A.5. JIEO Plan 9000, *Department of Defense and Intelligence Community Imagery Information Technology Standards Management Plan*, Central Imagery Office, Vienna, VA, 1 November 1995.
- A.6. *USIS Management Plan*, Version 1, Central Imagery Office, Vienna, VA, 13 October 1995.
- A.7. *USIS Objective Architecture Definition and Evolution*, Version 2, Central Imagery Office, Vienna, VA, 8 December 1995.
- A.8. *USIS Technical Architecture Requirements*, Version 2, Central Imagery Office, Vienna, VA, 8 December 1995.
- A.9. *USIS Standards & Guidelines*, Version 1, Central Imagery Office, Vienna, VA, 13 October 1995.
- A.10. *Standards Profile for Imagery Access*, Version 1, Central Imagery Office, Vienna, VA, 20 July 1995.
- A.11. *Common Imagery Interoperability Facilities (CIIF) Reference Model*, Version 1, 8 May 1996.
- A.12. *Joint Requirements Document for the United States Imagery System (USIS) 2000 Accelerated Architecture Acquisition Initiative (A3I)*, Version 1.0, 18 January 1996.
- A.13. *HAE UAV Concepts of Operations*, Version 2.0, 27 January 1995.
- A.14. *Defense Airborne Reconnaissance Office (DARO) Common Imagery Ground/Surface System (CIGSS) Acquisition Standards Handbook (CIGSS Handbook)*, Version 1.0, 9 June 1995.
- A.15. SECDEF Memorandum, *Specifications & Standards - A New Way of Doing Business*, 29 June 1994.

- A.16. JIEO Circular 9008, *National Imagery Transmission Format Standard (NITFS) Certification Test & Evaluation Program Plan*, 30 June 1994.
- A.17. DODD 5000.1, *Defense Acquisition*, 23 February 1991.
- A.18. DODD 5000.2, *Defense Acquisition Management Policies and Procedures*, 23 February 1991.

APPENDIX B - ACRONYMS

A³I - Accelerated Architecture Acquisition Initiative

ANSI - American National Standards Institute

API - Application Program Interface

ARD - Architecture Requirements Document

ATR - Automatic Target Recognition

CAF - Catalog Access Facility

CCB - Configuration Control Board

CI - Configuration Item

CIGSS - Common Imagery Ground / Surface System

CIIF - Common Imagery Interoperability Facility

CIIWG - Common Imagery Interoperability Working Group

CIL - Command Image Library

CIO - Central Imagery Office

CM - Configuration Management

COAX - Coaxial

COE - Common Operating Environment

COM - Component Object Model (Microsoft)

CONOPS - Concepts of Operation

CORBA - Common Object Request Broker Architecture

DARO - Defense Airborne Reconnaissance Office

DCE - Distributed Computing Environment

DCI - Director Central Intelligence

DIA - Defense Intelligence Agency

DII COE - Defense Information Infrastructure Common Operating Environment

DISA CFS - Defense Information Systems Agency Center for Standards

DMA - Defense Mapping Agency

DOD - Department of Defense

DODISS - Department of Defense Index of Specifications and Standards

DSP - Defense Standardization Program

EEI - External Environment Interface

ESIOP - Environment Specific Inter-ORB Protocol

FDDI - Fiber Distributed Data Interface

5D - Demand Driven Direct Digital Dissemination

FTP - File Transfer Protocol

GCCS - Global Command & Control System

GIOP - Generic Inter-ORB Protocol

HAE UAV - High Altitude Endurance Unmanned Aerial Vehicle

HTTP - Hyper Text Transfer Protocol

IAB - Internet Activities Board

IAF - Image Access Facility
IC - Intelligence Community
ICCB - Imagery Configuration Control Board
ICD - Interface Control Document
IDEX - Imagery Data Exploitation System
IDL - Interface Definition Language
IIOP - Internet Inter-ORB Protocol
IMS - Interoperable Map Software
IP - Internet Protocol
IPA - Image Product Archive
IPL - Image Product Library
ISB - Intelligence Systems Board
ISDN - Integrated Services Digital Network
ISMC - Imagery Standards Management Committee
ISO - International Standards Organization
ISS - Intelligence Systems Secretariat

JIEO - Joint Interoperability and Engineering Organization
JITC - Joint Interoperability Testing Command
JMTK - Joint Mapping Tool Kit
JRD - Joint Requirements Document
JTA - Joint Technical Architecture

MATRIX - Modular Automated Target Recognition for Interactive Exploitation
MIDB - Modernized Intelligence Database
MIL-STD - Military Standard
MINT - Multi-source Intelligence Tools

NEL - National Exploitation Lab
NIL - National Image Library
NITFS - National Imagery Transmission Format Standards
NPIC - National Photographic Interpretation Center
NTB - NITFS Technical Board

OASD - Office of the Assistant Secretary of Defense
OGC - Open GIS Consortium
OGIS - Open Geodata Interoperability Specification™
OLE - Object Linking & Embedding (Microsoft)
OMA - Object Management Architecture
OMG - Object Management Group
ORB - Object Request Broker
OS - Operating System
OSF - Open Systems Foundation
OSI - Open Systems Interconnect

PIKS - Programmer's Imaging Kernel System
POSIX - Portable Operating System for Information Exchange
PPP - Point-to-Point Protocol

RFC - Request for Change
RPC - Remote Procedure Call

SCC - Standards Coordinating Committee
SECDEF - Secretary of Defense
SMTP - Simple Mail Transfer Protocol
SPIA - Standards Profile for Imagery Access

TAFIM - Technical Architecture Framework for Information Management
TCP - Transmission Control Protocol

UDP - User Datagram Model
USIS - United States Imagery System
USIS S&G - United States Imagery System Standards & Guidelines
USIS TAR - United States Imagery System Technical Architecture Requirements

VWG - Video Working Group

WG - Working Group
W3C - World Wide Web Consortium

APPENDIX C - GLOSSARY

Adoption - The acceptance and approval of a Government or non-Government standard.

Application Program Interface (API) – The collection of available function calls (or other input/output mechanisms) that enable other systems to obtain services from, exchange data with, or otherwise interact with an application program.

Audience – The types of the intended consumers (callers) of an interface; similar in concept to the client side in the client/server software model.

Bearer – The object type that presents an interface; similar in concept to the server side in the client/server software model.

Certification - A statement attesting to the fact that a software product has been verified to conform to Facility specifications.

Common Facilities – A collection of higher-level services that are broadly applicable across many different application domains.

Common Imagery Interoperability Facilities (CIIF) – The collection of interface structures and services that will be rigorously standardized (using OMG's Interface Definition Language - IDL) to achieve effective interoperability among the digital elements that comprise the USIS Technical Architecture. The CIIF can be viewed as comprising the public API for the USIS. Also referred to as *Facilities*.

Common Imagery Interoperability Working Group (CIIWG) – The Government-sponsored, open-to-the-public consortium that is chartered to oversee the definition, design, and development of the USIS CIIF. The goal of the CIIWG is to ensure that the concerns of all interested parties (including commercial entities, the standards community, and other governmental organizations) are considered during the development of the CIIF.

Common Services - A collection of fundamental services (interfaces and objects) that provide basic functions for using and implementing distributed software objects. A variety of distributed computing standards are currently evolving such as CORBA, OLE, and DCE.

Configuration Control - The systematic proposal, justification, evaluation, coordination, approval or disapproval of proposed changes, and the implementation of all approved changes, in the configuration item after establishment of its baseline.

Configuration Control Board (CCB) - A board composed of technical and administrative representatives who recommend approval or disapproval of proposed engineering changes to a CI's current approved configuration documentation. The board also recommends approval or disapproval of proposed waivers and deviations from a CI's current approved configuration documentation.

Configuration Management (CM) - As applied to configuration items, a discipline applying technical and administrative direction and surveillance over the life cycle of items to:

- a. Identify and document the functional and physical characteristics of configuration items.
- b. Control changes to configuration items and their related documentation.
- c. Record and report information needed to manage configuration items effectively, including the status of proposed changes and implementation status of approved changes.
- d. Audit configuration items to verify conformance to specifications, drawings, interface control documents, and other contract requirements. (MIL-STD-973)

Conformance - adherence to a Facility's specifications

Consensus - Consensus by the CIIWG is achieved by simple majority vote.

Coordination - The process of having standardization documents reviewed and commented on by Government and private sector organizations.

Distributed Computing Infrastructure – Enables objects to make/receive requests/responses in a distributed computing environment. A variety of distributed computing standards are currently evolving, such as CORBA, OLE, and DCE.

Department of Defense Index of Specifications and Standards (DODISS) - A publication that lists Federal and military specifications and standards, guide specifications, military handbooks and bulletins, commercial item descriptions, adopted non-government standards, and other related standardization documents used by the DOD.

Executive Agent - CIIWG member organization tasked to develop assigned facilities.

Facility - See **Common Imagery Interoperability Facility**

Facility Maintenance - see **Configuration Control**

Imagery Interfaces – Interfaces to certain high-value services or capabilities that are specific to the imagery industry or application domain.

Implementation - Addresses operational assessment, CM, acquisition support, and enforcement.

Inheritance – An object-oriented programming concept in which crucial features of one software artifact are automatically passed to (inherited by) a subordinate software artifact. The Object Management Group's *Interface Definition Language* (IDL) includes support for multiple inheritance, in which a software interface object can inherit structural features from several other such objects at once.

Interface Definition Language (IDL) – A formal language (similar in appearance to a C++ header file) that is used to define the interfaces between interoperable software objects; can be

directly compiled into any of several common programming languages, using standard language mappings, to automatically set up the mechanisms needed to pass service requests across the network in a distributed software architecture.

Object Management Group (OMG) – A consortium of over 500 commercial and governmental organizations that oversees the development of certain object-oriented standards, methods, and technologies including IDL.

Reference Model - A reference model is intended to establish a framework for the development of consistent standards or specifications. A reference model is based on a small number of unifying concepts and may be used as a basis for education and explaining standards to a nonspecialist. (A reference model should be compatible with other, existing reference models to the extent practical.)

Specification - A Facility's IDL code.

Standard - Refers to a procedure, protocol, and development of specifications within any research and development technology area that will promote interoperability and compatibility of two or more components within the United States Imagery System (USIS). The Imagery and Research Development Council will recognize certain technical standards, those that are evolving or the absence of needed standards in making sure that research and development efforts will be successfully implemented as operational entities in the USIS.

Testing - Test procedures and tools are used to verify that a sample implementation conforms to the Facility specifications.

United States Imagery System (USIS) – The people, systems, and procedures (both current and future) that support the end-to-end production of imagery and imagery-related intelligence products. The USIS Technical Architecture, which focuses on defining both the near-term and long-term architecture of imagery-related *systems*, has been partitioned into eight digital elements:

- Management Element
- Digital Collection Element
- Digital Processing Element
- Dissemination Element
- Library Element
- Digital Exploitation Element
- Site Infrastructure Element
- Global Communications Element.

USIS Applications – Software objects specific to a the USIS. For example, the six application-layer digital elements in the USIS Technical Architecture (Management, Digital Collection, Digital Processing, Dissemination, Library, and Digital Exploitation) can be viewed as consisting (principally) of USIS Application objects.

APPENDIX D - MANAGEMENT MILESTONES

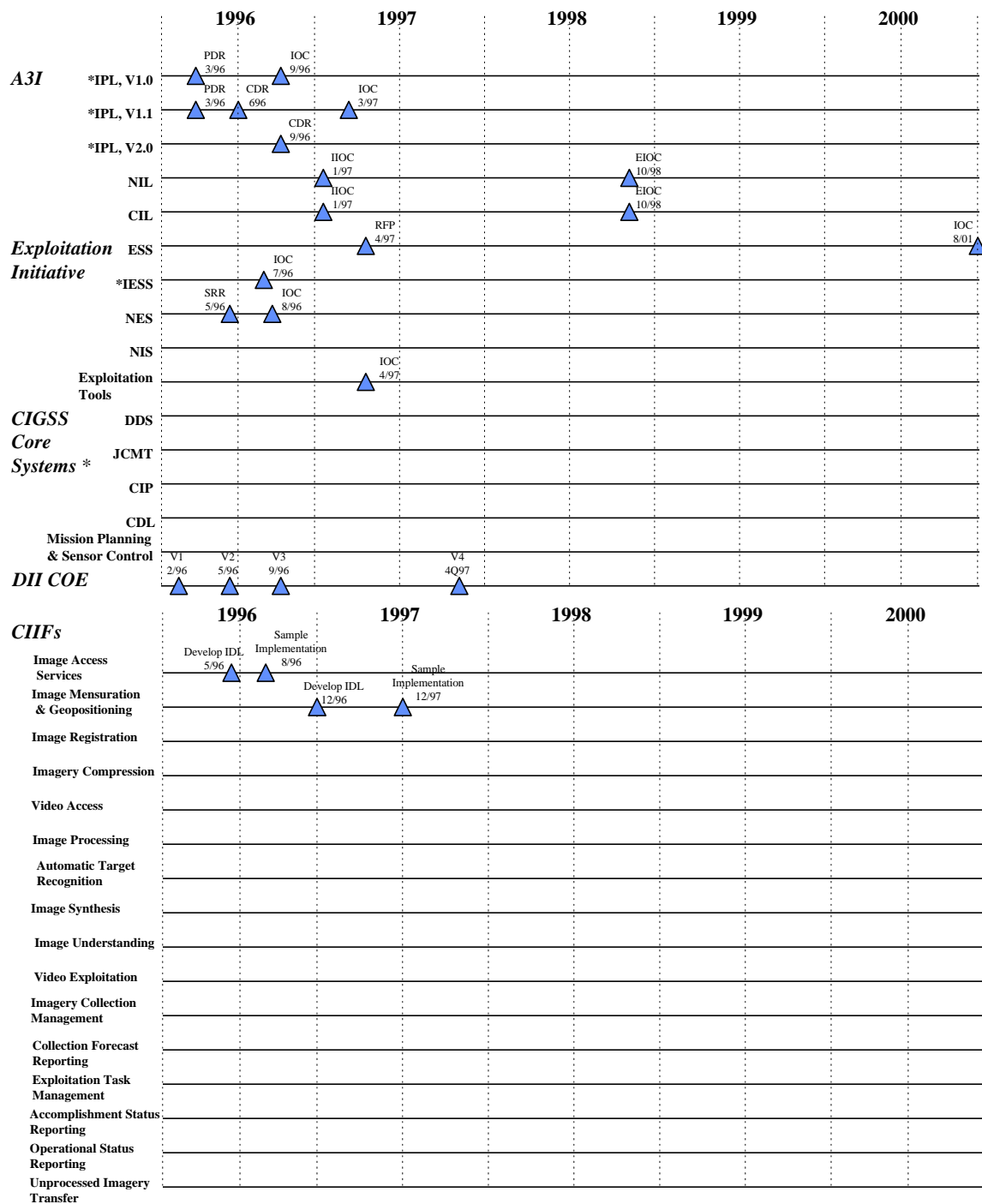
Event	Start Date	Finish Date
CIIWG Meetings		
Meeting #1		10/25/95
Meeting #2		11/30/95
Meeting #3		1/30/96
Meeting #4		3/28/96
Meeting #5		5/30/96
Meeting #6		7/16/96
Meeting #7		9/26/96
Meeting #8		11/96
Meeting #9		1/97
Meeting #10		3/97
Meeting #11		5/97
Meeting #12		7/97
Meeting #13		9/97
Meeting #14		11/97
Create & Maintain CIIF Reference Model		
Version 1:		
- Submit final Version 1 to ISMC for approval		5/8/96
- ISMC approval	5/96	7/96
- Publish Version 1		7/96
Version 2:		
- Establish list of changes & schedule for Version 2		4/29/96
- Brief CIIWG w/annotated outline of changes & schedule		5/30/96
- Initial draft	5/96	7/2/96
- CIIWG review		7/16/96
- SD-1 Coordination		7/96
- Final draft	7/96	8/30/96
- CIIWG approves Version 2 w/minor changes		9/26/96
- Publish final Version 2 to ISMC		9/30/96
Version 3:		
- Establish list of changes & schedule for Version 3		10/96
- Brief CIIWG w/annotated outline of changes & schedule		11/96
- Initial draft	11/96	1/97
- CIIWG review		1/97
- SD-1 Coordination		2/97
- Final draft	2/97	3/97
- CIIWG approves Version 3 w/minor changes		3/97
- Publish final Version 3 to ISMC		4/97

Version 4: - Establish list of changes & schedule for Version 4 - Brief CIIWG w/annotated outline of changes & schedule - Initial draft - CIIWG review - SD-1 Coordination - Final draft - CIIWG approves Version 4 w/minor changes - Publish final Version 4 to ISMC	5/97 8/97	4/97 5/97 7/97 7/97 8/97 9/97 9/97 10/97
Add Pointer to CIIF Reference Model, Version 1 in the USIS Standards & Guidelines	6/96	7/96
Add Pointer to CIIF Reference Model, Version 2 in the Joint Technical Architecture	10/96	1/97
Add Pointer to CIIF Reference Model, Version 2 in the Technical Architecture for Information Management	10/96	1/97
Create & Maintain CIIWG Management Plan - Submit final to ISMC for approval - ISMC approval - Publish final - Update document	5/96	5/8/96 7/96 7/96 As Required
Create & Maintain CIIF Brief - Create initial brief - Update brief - Update brief - Update brief - Update brief - Create Hyper Text Version - Continue to update brief	1/19/96 4/96	1/29/96 2/5/96 2/20/96 3/18/96 4/15/96 5/8/96 5/30/96 As Required
Conduct Object Technology & CIIF Tutorial - Identify agenda, course materials, cost - Identify instructors & course date - Conduct course		
Initiate CIIF as a New DOD Standards Project Using SD-3	5/96	5/96
Define CIIF Security Requirements - Develop statement of work - Conduct analysis & prepare reports, briefs - Integrate into <i>CIIF Reference Model</i> , Version 2	 3/96 7/96	 3/96 7/96 8/96
Develop Image Access / Catalog Access Facilities -		See App. G
Develop Image Registration Facility		See App. H
Develop Image Mensuration/Geopositioning Facility		See App. I
Develop Exploitation Support Facilities Based On MATRIX - Designate executive agent - Develop IDL specifications	6/96	5/96 TBD
Test Image Access / Catalog Access Facilities On Corba ORB With MIDB - MIPR work statement & funds to DISA/CFS - Develop & test software	1/96 7/96	5/96 7/97
Establish Product Certification/Branding Strategy		TBD

- Determine policy & put into <i>CIIWG Mangement Plan</i> - Task JITC to develop CIIF certification/branding program		
Establish Working Relationship with OGC	4/96	TBD
Establish Working Relationship with DMA IMS Program	4/96	TBD

APPENDIX E - MASTER SCHEDULE

The CIIWG activities will be coordinated with other imagery community initiatives which require standard APIs. Such activities are included in the following diagram:



Note: Components marked with an asterik (*) are also part of the CIGSS Core Systems.

APPENDIX F - EXECUTIVE AGENT ASSIGNMENTS

1. IMINT

- Image Access Facility
- Catalog Access Facility
- Imagery Dissemination Facility
- Profile & Notification Facility
- Image Registration Facility

2. NPIC

- Image Mensuration Facility
- Geopositioning Facility

APPENDIX G - IMAGE ACCESS SERVICES SPECIFICATION

- **Executive Agent:** IMINT

- **Image Access Facility**

Server Interface: *management of the connection between client and IAF/CAF servers*

ImageLibrary Interface: *imagery specific extensions to the Storage & Retrieval Facility to ensure imagery interoperability and functionality*

ImageProduct Interface: *to provide image product references used for full product retrieval*

ImageArray Interface: *to provide image product references used for tile retrieval*

Parameters Interface: *managing parameters and specialized metadata directly associated with particular objects*

- **Catalog Access Facility**

ImageCatalog: *discovery of image products involving geographic search and boolean queries, retrieval of imagery metadata attributes*

- **Profile & Notification Facility**

ProfileNotification: *posting standing queries for future satisfaction*

- **Imagery Dissemination Facility**

Dissemination: *definition of standing dissemination requests*

- **Schedule:**

Event	Start Date	Finish Date
Develop IDL specification	11/95	5/1/96
Develop & test sample implementation	6/96	8/96
Update IDL specification		9/96
CIIWG approval		10/96
ISMC approval as USIS Standard		
Submit as proposal to commercial / international / military standard as appropriate		
Adopt commercial / international / military standard as appropriate		

APPENDIX H - IMAGE REGISTRATION FACILITY

- **Executive Agent:** IMINT
- **Services Provided:**
- **Schedule:**

Event	Start Date	Finish Date
Develop IDL specification		
Develop & test sample implementation		
Update IDL specification		
CIIWG approval		
ISMC approval as USIS Standard		
Submit as proposal to commercial / international / military standard as appropriate		
Adopt commercial / international / military standard as appropriate		

APPENDIX I - IMAGE MENSURATION AND GEOPOSITIONING FACILITIES

- **Executive Agent:** NPIC

- **Services Provided:**

- **Schedule:** **Start** **Finish**

Event	Start Date	Finish Date
Develop IDL specification	1/96	12/96
Develop & test sample implementation	1/97	12/97
Update IDL specification		TBD
CIIWG approval		
ISMC approval as USIS Standard		
Submit as proposal to commercial / international / military standard as appropriate		
Adopt commercial / international / military standard as appropriate		